ODD SEMESTER 2022-2023

TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms.R.Akshaya**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGD**

Name of the Paper : **Physical Geology**

Lecture Hours : **30 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• Understanding the physical and chemical properties of the lithosphere and atmosphere. • To compare and contrast weathering among different rock types and different environments. • To explain the various parts of hydrologic cycle including the interaction of surface and groundwater with the solid earth. • To describe and interpret surficial deposits. And landforms. • To understand the basic fundamentals of tsunami.	On completion of the course students should be able to • CO 1: Understand the concepts of weathering. • CO 2: Understand the process and features formed due to running water • CO 3: Know the sources of groundwater and its features. • CO 4: Know the weathering process of glaciers and ice age. • CO 5: Determining the ocean features and tsunami.	❖ Power Point ❖ E – Module ❖ Chalk & Talk Method ❖ Lecture Method ❖ Discussion Method ❖ Study Assignment Method, ❖ Seminar Method ❖ Demonstration Method

C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
Unit - IV Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Glaciers – origin and types of glaciers – movement of glaciers • Transportation and deposition – glacio fluvial deposits • Landforms produced by glaciers. Short account of	18.07.2022 to 30.08.2022	3 Hrs 3 Hrs 3 Hrs	3 Hrs	-

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	Ice ages. • Lakes – classification – types of lakes – lake deposits.		3 Hrs		
Unit - V Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Seas and Oceans – waves tides and currents – sea as a geological agent • Classification of shore line – shore line types • Description of continental margin – continental – shelf – continental slope – ocean basin – submarine canyons – sea mount, guyots mid – oceanic ridges – ocean deposits • Coral reef: their types and origin; Tsunamis – distribution and origin.	31.08.2022 to 22.10.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-

D. <u>ACTIVITIES:</u>

Activities Name	Details
Test	Unit Test Date 17.08.2022,19.10.2022
Assignment	25.08.2022, 06.10.2022
Quiz	06.09.2022 and 28.10.2022(Objective Type Questions)
Seminar	02.09.2022 to 20.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A.GENERAL INFORMATION

Name of the Faculty : **Ms.R.Akshaya**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGEY**

Name of the Paper : **Palaeontology and Crystallography**

Lecture Hours : **18 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• To identify the different types of fossils. • To know the evolutionary period of fossils. • To identify some of the morphological characteristics of fossils. • To understand the crystal structure. • To learn the twinning of crystals.	On completion of the course students should be able to • CO 1: Find, collect, prepares, study and exhibit fossils. • CO 2: Collect and analyze geologic materials infield. • CO 3: Determine the environment of the earth during the geologic past. • CO 4: Interpret the miller indices of crystals. • CO 5: Recognize crystallographic panes and directions.	• Power Point • E – Module • Chalk & Talk Method • Lecture Method • Discussion Method • Study Assignment Method, • Seminar Method • Demonstration Method

C. <u>PLAN OF THE WORK:</u>

Unit / Modules	Topic to be covered	Proposed date	Practical Hrs	Assessment Hrs	Remarks
Practical - 6 Hours, Assessment-3 Hours, Total – 9 Hours	PALAEONTOLOGY Megascopic identification and description of the following fossils:- Corals: Calceola, Zaphrentis, Favosites, Halysites,; Brachiopoda: Spirifer, Productus, Terebratula, Rhynconella, Atrypa, Athyris, Orthis, Echinodermata: Pentrimites, Cidaris, Hemicidaris, Micraster, Holaster, Hemiaster, Stygmatophygus, Mollusca: Pelecypoda: - Arca,	18.07.2022 to 10.10.2022	6 Hrs	3 Hrs	-

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	Cardium, Meretrix, Cardita, Pecten, Trigonia, Megaladon, Pholodomya, Gryphea, Exogyra, Ostrea, Inoceramus, Alectryonia. Gasteropoda:- Natica,Turbo, Trochus, Turritella, Cerethium, Conus, Voluta, Murex, Fusus, Physa, Bellerophon. Cephalopoda:- Nautilus, Goniatites, Ceratites, Acanthoceras, Scholenbachia, Perisphinctes, Hamites, Scaphites, Baculites, Turrilites and Belemnites, Arthropoda: Trilobita:- Paradoxides, Calymene, Phacops. Trinucleus, Graptolites: - Phyllograptus, Tetragraptus, Didymograptus, Diplograptus, Monograptus, Plant fossils:- Glossopteris, Gangamopteris, Ptillophyllum, Lepidodendron, Sigillaria andCalamites				
Practical - 6 Hours, Assessment- 3 Hours, Total – 9 Hours	MICRO FOSSILS Lagena, Nodosaria, Textularia, Operculina, Elphidium, Ammonia.	11.10.2022 to 31.10.2022	6 Hrs	3 Hrs	-

ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 18.10.2022
Assignment	29.08.2022, 20.10.2022
Quiz	28.10.2022(Objective Type Questions)
Seminar	22.09.2022 to 27.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms.R.Akshaya**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGH**

Name of the Paper : **Mineralogy**

Lecture Hours : **75 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• The first unit deals with the introduction to the rock forming minerals and other concepts related to mineralogy. • The second unit deals with the physical, chemical and optical properties of common rock forming minerals. • Recognize that minerals are chemical compounds made up of atoms linked together by a variety of chemical bond types. • Systematic mineralogy of common rock forming minerals.	Of the course students On completion should be able to • CO 1: Student thoroughly understands the various crystal structures and megascopic and optical characters of various minerals. • CO 2: Understand the basic crystal-chemical properties of minerals and how variability in these properties relates to physical and optical characteristics as well as the formation and stability of minerals in igneous, metamorphic, and sedimentary environments. • CO 3: Recognize and quantify the physical and optical properties of minerals. • CO 4: Microscopic thin section study and identity characterize common rock-forming minerals. • CO 5: Extract information about	• Power Point • E – Module • Chalk & Talk Method • Lecture Method • Discussion Method • Study Assignment Method, • Seminar Method • Demonstration Method

	the conditions of formation and subsequent history of a mineral from its properties and its presence in a rock.	

C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
UNIT I Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• DESCRIPTIVE MINERALOGY • Definition of Mineral and Mineraloid – Scope and aim of Mineralogy. Chemical elements and periodic Table – • Bonding of atoms – Metallic, Co-valent, Ionic and Van der Walls Bonding in Minerals, • Structure and classification of silicates. Isomorphism, Polymorphism and Pseudomorphism in minerals. • Physical properties of minerals depending upon cohesion and elasticity, specific gravity, light, heat, electricity, magnetism and the senses.	18.07.2022 to 04.08.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-
UNIT II Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Mineralogy, Structure, Chemistry, Optical and Physical properties, modes of occurrences and industrial uses of the following groups of minerals: Polymorph and varieties of Quartz • Alkali and Plagioclase group of Feldspars – Nepheline and Sodalite • Feldspathoides • Zeolites.	05.08.2022 to 20.08.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-

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UNIT III Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Mineralogy, Structure, Chemistry, Optical and Physical properties, Modes of occurrences and industrial uses of the following groups of minerals: Pyroxenes, • Amphiboles, • Micas and Olivine • Garnet.	22.08.2022 to 07.09.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	
UNIT IV Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Nature of light – Ordinary and polarized light – Refraction and reflection. Refractive index, Critical angle and Total internal reflection. • Double refraction – Plane polarization by Reflection, Brewster's law – Plane polarization by Refraction, Nicol Prism – Plane polarization by absorption, Polaroid. • Petrological microscope and its parts • Optical accessories, their construction and uses – Quartz wedge (Determination of order of Interference Colour) – Gypsum plate and Mica plate (Determination of Fast and Slow vibration directions) and Bereck Compensator (Determination of Birefringence)	09.09.2022 to 27.09.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	
UNIT V Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Optical classification of minerals. Optical properties of isotropic and anisotropic minerals observed under parallel and crossed Nicols. Differences between Isotropic and anisotropic minerals. • Definition of extinction, Types of extinction, Extinction angles and their determination, and uses	28.09.2022 to 29.10.2022	3 Hrs 3 Hrs	3 Hrs	

	• Characters of Uniaxial and biaxial minerals – Optics axis and optic axial angle – Acute and Obtuse Bisectrix • Optic sign of Uniaxial and Biaxial minerals – Uniaxial and Biaxial Indicatrix – Sign of elongation – Optical anomalies.		3 Hrs 3 Hrs		

D. <u>ACTIVITIES:</u>

Activities Name	Details
Test	Unit Test Date 22.08.2022, 07.10.2022
Assignment	10.08.2022, 21.10.2022
Quiz	16.09.2022 and 19.10.2022(Objective Type Questions)
Seminar	05.09.2022 to 29.09.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms.R.Akshaya**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGIY**

Name of the Paper : **Mineralogy and Applied Geology**

Lecture Hours : **48 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• To learn the megascopic and Microscopic identification of Quartz, Feldspar, Feldspathoid, Pyroxene and Amphibole groups. • Describe the characteristics physical properties that we use to identify minerals, including crystal shape, color, luster and hardness. • To discuss the cite examples of the important properties and characteristics of the silicate nonsilicate rock forming minerals. • To interpret the hydrogeological data. • To solve the calculation of ore reserves.	On completion of the course students should be able to • CO1: Describe several common mineral crystal habits. • CO 2: Investigate the nature of things through observation and using their senses. • CO 3: Compare samples kinds of several of rock, and identify similarities and differences. • CO 4: Describe some common uses of rocks and minerals • CO 5: understands the various crystal structures and megascopic and optical characters of various minerals.	• Power Point • E – Module • Chalk & Talk Method • Lecture Method • Discussion Method • Study Assignment Method, • Seminar Method • Demonstration Method

C. <u>PLAN OF THE WORK:</u>

Unit / Modules	Topic to be covered	Proposed date	Practical Hrs	Assessment Hrs	Remarks
Practical - 9 Hours, Assessment-3 Hours, Total – 12 Hours	MEGASCOPIC MINERALOGY • Megascopic identification and description of the following: Quartz, Rosy quartz, Amethyst, Chalcedony, Agate, Flint,	18.07.2022 to 04.08.2022			-

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	Jasper, Chert, Opal, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Sodalite, Enstatite, Bronzite, Hypersthene, Diopside, Augite, Spodumene, Acmite, Rhodonite, Wolastonite, Anthopillite, Tremolite, Actinolite, Hornblende, Glaucophane, Olivine, Serpentine, Muscovite, Biotite, Vermiculite, Chlorite, Epidote, Garnet, Olivine, Natrolite, Stilbite, Apophyllite, Talc, Steatite, Andalusite, Kyanite, Sillimanite, Staurolite, Cordierite, Apatite, Beryl, Topaz, Calcite, Dolomite, Tourmaline, Zircon, Fluorite.		9 Hrs	3Hrs	
Practical - 9 Hours, Assessment- 3 Hours, Total – 12 Hours	MICROSCOPIC MINERALOGY • Microscopic identification and Description of the following:- Quartz, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Enstatite, Hypersthene, Glaucophane, Biotite, Muscovite, Olivine, Epidote, Garnet, Apatite, Zircon, Sphene, Tourmaline, Calcite, Andalusite, Kyanite, Sillimanite, Staurolite, and Cordierite.	05.08.2022 to 20.08.2022	9 Hrs	3 Hrs	-
Practical - 9 Hours, Assessment- 3 Hours, Total – 12 Hours	APPLIED GEOLOGY Interpretation of maps – Calculation of ore reserves – Included area method. Simple problems relating to interpretation of hydro geological data.	22.08.2022 to 27.09.2022	9 Hrs	3 Hrs	

Practical - 9 Hours, Assessment- 3 Hours, Total – 12 Hours	BLOW PIPE Identification of the following mineral powders by simple blow pipe tests:- Apatite, Barite, Calcite, Celestite, Cerusite, chalcopyrite, Galena, Gypsum, Chromite, Haematite, Magnesite, Magnetite, Psilomelane, Pyrolusite, Siderite, Sphalerite, Strontianite, Witherite, Stibnite, Ilmenite andWolframite.	28.09.2022 to 29.10.2022	9 Hrs	3 Hrs	

D. <u>ACTIVITIES:</u>

Activities Name	Details
Test	Unit Test Date 14.09.2022, 12.10.2022
Assignment	26.08.2022, 07.10.2022
Quiz	16.09.2022 and 21.10.2022(Objective Type Questions)
Seminar	22.09.2022 to 07.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms.R.Akshaya**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGE3**

Name of the Paper : **Environmental Geology and Hydrogeology**

Lecture Hours : **30 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• To study the environmental problems and hazards. • Understanding the components of the Hydrologic cycle. • To estimate aquifer properties and well design • To study on ground water exploration • Derivation ground water chemistry and quality • Application of ground water problem.	• On completion of the course students should be able to • CO1: Student would understand the hydrodynamics, quality of groundwater, groundwater exploration and groundwater conservation • CO 2: Understand the components of hydrologic cycle. • CO 3: Understand measurement of ground water exploration techniques. • CO 4: Understand the various artificial recharge techniques. • CO 5: Understand the quality of groundwater.	• Power Point • E – Module • Chalk & Talk Method • Lecture Method • Discussion Method • Study Assignment Method, • Seminar Method • Demonstration Method

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C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
UNIT I Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	• Environmental geology: Definition of ecology and environmental Geology. Different ecosystems. Classification of Natural resources. A short account of renewable and nonrenewable resources. • Environmental problems due to surface geological processes. Causes, hazards and remedial measures relating to landslides • Floods, and soil erosion, Impact of wind on environment. • Degradation of coastal environment and measures for coastal protection.	18.07.2022 to 30.08.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-
UNIT II Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	• Influence of deep seated geological processes – Earthquake hazards, Earthquake prediction control and warning; • Reservoir – induces seismicity – hazards of volcanism; Techniques of volcanic prediction and human adjustments to volcanic environments. Benefits of volcanism. • Man as an agent of environmental modifications. Environmental degradation due to mining and mineral processing. • Effects of urbanization on surface water, causes for ground water pollution. Population explosion and their pressure on geological environments.	01.09.2022 to 28.10.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-

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D. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 24.08.2022,14.10.2022
Assignment	17.08.2022, 06.10.2022
Quiz	07.09.2022 and 19.10.2022(Objective Type Questions)
Seminar	22.09.2022 to 21.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms.R.Akshaya**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGE4**

Name of the Paper : **Remote Sensing and Mining Geology**

Lecture Hours : **30 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• The paper deals about the basics of remote sensing and image processing. • Attain a foundational knowledge and comprehension of the physical, computational, and perceptual basis for remote sensing. • Gain familiarity with a variety of earth science applications of remote sensing. • To study the sensor characteristics, satellite orbits and various current and future missions involving a range of sensors across the visible, radar and microwave components of the spectrum • To study the surface and underground mining methods	On completion of the course students should be able to • CO1: Recognize and explain at basic level fundamental physical principles of remote sensing, including the electromagnetic spectrum; the emission, scattering, reflection, and absorption of electromagnetic (EMR) radiation • CO 2: Understand the remote sensing, image processing and application of Geographic Information system. • CO 3: Recognize and explain basic computational properties of remote sensing data acquisition, storage, and image processing. • CO 4: Discuss the surface and subsurface mining methods.	• Power Point • E – Module • Chalk & Talk Method • Lecture Method • Discussion Method • Study Assignment Method, • Seminar Method • Demonstration Method

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C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
UNIT IV Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	• Role of geology in mining industries – definition of mining terms, shaft, Hanging wall, Adit, roof, Drive crosscut, Tunnel, Raise, Winze, Stope – • Types; Surface methods of mining, Alluvial mining – pan & betea, sluicing, Hydraulicking, Dredging. • opencast mining. Benches, Explosives, working slope • Mining equipments – Dragline, power showels.	20.07.2022 to 26.08.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-
UNIT V Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	• Subsurface mining :- (underground mining)- advantages and limitations. • Stoping – open stopes, supported stopes, pillar supported stopes – square supported stoping – timber supported stopes- filled stopes – shrinkage stopes – shaft sinking. • Caving; Top slicing. Sublevel caving and Block caving. Coal mining (surface mining) Strip mining and Augering. • Underground mining. Room and pillar method – Longwall method-hydraulicking. Mineral Economics and its concept. Role of Minerals in National Economy. Problems peculiar to Mineral Industry, strategic, critical and Essential Minerals. Mineral conservation and substitution.	30.08.2022 to 19.10.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-

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D. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 13.08.2022,18.10.2022
Assignment	02.09.2022, 10.10.2022
Quiz	13.09.2022 and 27.10.2022(Objective Type Questions)
Seminar	22.09.2022 to 29.09.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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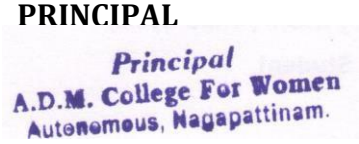

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TEACHING PLAN

E. GENERAL INFORMATION

Name of the Faculty : **Ms.R.Akshaya**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGS3**

Name of the Paper : **Geostatatistics and Computer Application**

Lecture Hours : **30 Hrs**

F. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• Understanding the mathematical and statistical principles of numerical data. • To determine whether the correlation and regression is significant. • To learn and practice basic keyboarding and mouse use and search engines, and locate www addresses. • To demonstrate an understanding of computer programming language concepts. • To gain a basic, Assessment understanding of GIS and GPS concepts, techniques and real world applications.	On completion of the course students should be able to • CO 1: Perform proper and efficient sample statistical assessment and to statistically characterize spatially referenced data. • CO 2: Apply effective quantitative analysis of spatial and spatio-temporal data • CO 3: Demonstrate a basic understanding of computer hardware and software. • CO 4: Implement the algorithms and draw flowcharts for solving mathematical problems. • CO 5: Create maps, images to communicate spatial data in a meaningful way to others.	• Power Point • E – Module • Chalk & Talk Method • Lecture Method • Discussion Method • Study Assignment Method, • Seminar Method • Demonstration Method

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G. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
UNIT I Lecture - 4 Hours, Assessment- 2 Hours, Total – 6 Hours	• Numerical data in geoscience. Frequency distribution: Mean median, mode, dispersion. • Measures of Dispersion • Skewness • Kurtosis, addition, multiplication and division.	20.07.2022 to 03.08.2022	4 Hrs	2 Hrs	-
UNIT II Lecture - 4 Hours, Assessment- 2 Hours, Total – 6 Hours	• Sampling and sampling plan in Geoscience: Sample Random Sampling Systematic and stratified and Cluster sampling: • Standard errors. • Correlation • Regression Analysis in Geoscience.	04.08.2022 to 30.08.2022	4 Hrs	2 Hrs	-
UNIT III Lecture - 4 Hours, Assessment- 2 Hours, Total – 6 Hours	• Introduction to Computer-Elements of computer: Hardware and Software. • Input devices- keyboard, mouse. • Output devices-Monitor, Printer. Memory: primary-ROM, RAM. • Secondary Memory-Hard Disk, Floppy & CD.	01.09.2022 to 23.09.2022	4 Hrs	2 Hrs	-
UNIT IV Lecture - 4 Hours, Assessment- 2 Hours, Total – 6 Hours	• A short account on: Algorithm-Flow charts • Programming languages. Computer applications in geology: • Flow chart for simple programmes • Geological aspects in window.	27.09.2022 to 18.10.2022	4 Hrs	2 Hrs	-
UNIT V Lecture - 4 Hours, Assessment- 2 Hours, Total – 6 Hours	• Basic principles of GIS. Elements, concepts and • Usefulness of GIS, components of GIS. Data source, spatial data • Raster and vector data- Data analysis and application. • Global Positioning System.	19.10.2022 to 09.11.2022	4 Hrs	2 Hrs	-

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H. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 17.08.2022, 12.10.2022
Assignment	25.08.2022, 19.10.2022
Quiz	02.09.2022 and 07.10.2022(Objective Type Questions)
Seminar	09.09.2022 to 29.09.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms. P.V. Dhaarani**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGD**

Name of the Paper : **Physical Geology**

Lecture Hours : **45 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• Understanding the physical and chemical properties of the lithosphere and atmosphere. • To compare and contrast weathering among different rock types and different environments. • To explain the various parts of hydrologic cycle including the interaction of surface and groundwater with the solid earth. • To describe and interpret surficial deposits and landforms. • To understand the basic fundamentals of tsunami.	On completion of the course students should be able to CO 1: Understand the concepts of weathering. CO 2: Understand the process and features formed due to running water CO 3: Know the sources of groundwater and its features. CO 4: Know the weathering process of glaciers and ice age. CO 5: Determining the ocean features and tsunami.	❖ Power Point ❖ E – Module ❖ Chalk & Talk Method ❖ Lecture Method ❖ Discussion Method ❖ Study Assignment Method, ❖ Seminar Method ❖ Demonstration Method

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C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
Unit I Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Weathering of rocks • Atmosphere its composition and zones • Geological action of wind • Arid cycle of erosion & characteristics of dessert	18.07.2022 to 12.08.2022	3 Hrs 3 Hrs 3 Hrs 3 Hrs	3 Hrs	-
Unit II Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Running water, source and surface flow • Geological work of running water • The process of valley development • Stream Rejuvenation and River capture	17.08.2022 to 12.09.2022	3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-
Unit III Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Source of underground water • Geological work of groundwater • Development of Karst Topography • Artesian belt of Tamilnadu	15.09.2022 to 21.10.2021	3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-

D. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 16.8.2021, 14.9.2021, 25.10.2021,
Assignment	24.8.2022, 22.9.2022, 29.10.2022
Quiz	26.8.2022,15.10.2022, 30.10.2022(Objective Type Questions)
Seminar	27.9.2022,20.10.2022,28.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

E. GENERAL INFORMATION

Name of the Faculty	**:**	**Ms. P.V. Dhaarani**
Department	**:**	**Geology**
Programme	**:**	**B.Sc**
Programme Code	**:**	**BGEY**
Name of the Paper	**:**	**Palaeontology and Crystallography**
Lecture Hours	**:**	**27 Hrs**

F. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• To identify the different types offossils. • To know the evolutionary period offossils. • To identify some of the morphological characteristics offossils. • To understand the crystalstructure. To learn the twinning ofcrystals	On completion of the course, learners should be able to CO 1: Find, collect, prepares, study and exhibit fossils. CO 2: Collect and analyze geologic materials infield. CO 3: Determine the environment of the earth during the geologic past. CO 4: Interpret the miller indices of crystals. CO 5: Recognize crystallographic panes and directions.	❖ Power Point ❖ E – Module ❖ Chalk & Talk Method ❖ Lecture Method ❖ Discussion Method ❖ Study Assignment Method, ❖ Seminar Method ❖ Demonstration Method

G. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Assessment Hrs	Practical Hrs	Remarks
Practical - 6 Hours, Assessment-3 Hours, Total – 9 Hours	CRYSTAL MODELS Identification and description of the following crystal models: Galena, Garnet, Fluorite, Pyrite, Tetrahedrite, Boracite, Sphalerite, Cuprite, Zircon, Cassiterite, Rutile,	22.09.2022 to 12.10.2022	3 Hrs	6 Hrs	-

	Octahedrite, Apophyllite, Vesuvianite, Scheelite, Meonite, Wulfenite, Chalcopyrite, Beryl, Zincite, Apatite, Calcite, Haematite, Dolomite, Corundum, Tourmaline, Phenacite, Dioptase, Quartz, Olivine, Topaz, Barite, Andalusite, Cordierite, Sulphur, Staurolite, Hypersthene, Calamine, Struvite, Epsomite, Gypsum, Orthoclase, Augite, Hornblende, Epidote, Sphene, Axinite, Albite, Kyanite and Rhodonite.				
Practical - 6 Hours, Assessment-3 Hours, Total – 9 Hours	CRYSTAL MODELS Identification of crystal models Dolomite, Corundum, Tourmaline, Phenacite, Dioptase, Quartz, Olivine, Topaz, Barite, Andalusite, Cordierite, Sulphur, Staurolite, Hypersthene, Calamine, Struvite, Epsomite, Gypsum, Orthoclase, Augite, Hornblende, Epidote, Sphene, Axinite, Albite, Kyanite and Rhodonite.	17.10.2021 to 27.10.2021	3 Hrs	6 Hrs	-
Practical - 6 Hours, Assessment-3 Hours, Total – 9 Hours	SIMPLE TWIN MODELS Galena, Fluorite, Pyrite, Rutile, Calcite, Quartz, Staurolite, Gypsum, Augite, Orthoclase, Albite.	28.10.2022 to 03.11.2022	3 Hrs	6 Hrs	-

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H. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 22.09.2022,19.10.2022
Assignment	07.09.2022, 27.10.2022
Quiz	29.09.2022 and 31.10.2022(Objective Type Questions)
Seminar	16.09.2022 to 25.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty	**:**	**Ms. P.V. Dhaarani**
Department	**:**	**Geology**
Programme	**:**	**B.Sc**
Programme Code	**:**	**BGG**
Name of the Paper	**:**	**Stratigraphy**
Lecture Hours	**:**	**75 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• To learn about the geological time scale, principles of stratigraphy and the description of strata and their relationship to tectonics, climate, fossils along with their distribution in different parts of India from Precambrian to recent. • To study the geological and applications of stratigraphy. • To realize the different geological epoch formation. • To collect stratigraphic data in the field. • To synthesize geological and biological information to interpret local and regional geologic history.	On completion of the course, learners should be able to CO 1: It focus specifically on settings and time periods that the students will encounter on our field trips, emphasizing the combined use of sedimentological characteristics and fossil content CO 2: Student would understand the Indian Stratigraphy and its age related problems. CO 3: Utilizes both forward reasoning and inverse reasoning to construct one or more hypotheses for the paleogeographic and environmental histories that produced a series of strata. CO 4: The course then adds larger geological principles to the foundation stratigraphy, effects of sedimentary processes and sedimentation rates on interpretation of evolution in the fossil record.	❖ Power Point ❖ E – Module ❖ Chalk & Talk Method ❖ Lecture Method ❖ Discussion Method ❖ Study Assignment Method, ❖ Problem Solving Method ❖ Seminar Method ❖ Demonstration Method

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C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
Unit I Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	Principles of Stratigraphy: • Law of order of superposition. law of uniformitarianism and law of faunal succession. • Correlation: fossiliferous and unfossiliferous rocks. Standard stratigraphic scale and Indian Geologic Time scale. Imperfections in Geological record. • Geological divisions. Stratigraphic classification and Nomenclature. Stratigraphic Units: Lithostratigraphic unit, Biostratigraphic unit , Geochronologic Unit. Homotaxis. • Physiographic divisions of India: Peninsular India, Indogangetic alluvial plains, Extra Peninsular India.	18.07.2022 to 12.08.2022	3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-
Unit II Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	Precambrian Stratigraphy: • Archaeans of Dharwar Province, Archaeans of Eastern Ghat - The Sausar and Sakoli Group, Archaeans of Singhbhum – Iron Ore Group and Gangpur Group. • Archaeans of Tamilnadu, Mineral Wealth of Archaeans of India, The Eparchaean Unconformity, • Stratigraphy and Mineral Wealth of Cuddapahs, • Stratigraphy and Mineral Wealth of Vindhyans, Kurnool	17.08.2022 to 12.09.2022	3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-

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	group, Life during Precambrian.				
Unit III Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	Paleozoic Stratigraphy: • Distribution of Paleozoic rocks in India, Cambrian of Salt Range, Age of Saline Series, • Upper Carboniferous and Permian rocks of Salt Range, • Paleozoic rocks of Kashmir Valley, Paleozoic rocks of Spiti Valley, • Paleozoic rocks of Peninsular India.	15.09.2022 to 21.10.2021	3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-
UNIT IV Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	Mesozoic Stratigraphy: • The Depositional Environment-distribution-life-classification and economic importance of Gondwana formations of India, • Coastal Gondwana of India, Gondwana formations of Tamilnadu, • Triassic of Spiti – The Lilang System, Jurassic of Kutch, • Cretaceous of Tiruchirapalli – Pondicherry – Bagh Beds, Deccan traps		3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-
UNIT V Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	Cenozoic Stratigraphy: • Comprehensive account of the geological events took place during Cenozoic era in India, • rise of Himalayas, stratigraphy of Siwalik Super Group, fauna and flora of Siwaliks, • Tertiary rocks of Assam, Karewa formation, Tertiary rocks of Tamilnadu, Tertiary rocks of Kerala, • Pleistocene Glaciation -		3Hrs 3Hrs 3Hrs	3Hrs	-

	Mineral wealth of Tertiary rocks of India.		3Hrs		

D. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 16.8.2021, 14.9.2021, 25.10.2021,
Assignment	24.8.2022, 22.9.2022, 29.10.2021
Quiz	26.8.2022,15.10.2022, 30.10.2022(Objective Type Questions)
Seminar	27.9.2022,20.10.2022,28.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms. P.V. Dhaarani**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGE3**

Name of the Paper : **Environmental Geology and Hydrogeology**

Lecture Hours : **45 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• To study the environmental problems and hazards. • Understanding the Components of the hydrologic cycle • To estimate aquifer properties and well design • To study on ground water exploration • Derivation ground water chemistry and quality • Application of ground water problem	On completion of the course, learners should be able to CO 1: Student would understand the hydrodynamics, quality of groundwater, groundwater exploration and groundwater conservation CO 2: Understand the components of hydrologic cycle. CO 3: Understand measurement of ground water exploration techniques CO 4: Understand the various artificial recharge techniques CO 5: Understand the quality of groundwater.	❖ Power Point ❖ E – Module ❖ Chalk & Talk Method ❖ Lecture Method ❖ Discussion Method ❖ Study Assignment Method, ❖ Problem Solving Method ❖ Seminar Method ❖ Demonstration Method

C. PLAN OF THE WORK

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
Unit III Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	Hydrogeology : • Ground water in Hydrologic cycle, origin of ground water meteoric water, connate water and Juvenile water • Vertical distribution of		3Hrs 3Hrs		-

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	ground water, zone of aeration, zone of saturation and water table. Springs • Geological conditions favouring development of springs. Definition of aquifers, aquitards and aquicludes. • Geologic formations as Aquifers. Types of Aquifers – unconfined, confined, and perched Aquifers – Artesian wells, peizometric surface.	26.07.2022 to 15.08.2022	3Hrs 3Hrs	3Hrs	
Unit IV Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Rock properties affecting Ground Water, openings in rocks. types of openings – primary openings – secondary openings. • Porosity, specific yield, specific retention and permeability. • Ground water movement - forces causing ground water movement: seepage, capillary movement, laminar flow, turbulent flow, Darcy's law co-efficient of permeability and field measurement of permeability. • Fluctuations in Ground water levels – causes of fluctuations.	20.08.2022 to 18.10.2022	3Hrs 3Hrs 3 Hrs 3Hrs	3Hrs	-
Unit V Lecture - 12 Hours, Assessment- 3 Hours, Total – 15 Hours	• Ground water quality – physical, Bacterial, and chemical qualities – drinking water standards – major ions affecting chemical quality of ground water. • Ground water recharge – natural and artificial recharge. Ground water exploration – surface methods – electrical resistivity method. • Water wells – types of wells – well construction	20.10.2022 to 13.11.2022	3 Hrs 3Hrs 3 Hrs	3Hrs	-

	and development – collector wells and infiltration galleries. • Ground water in Tamil Nadu.		3Hrs		

D. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 22.8.2022, 21.10.2022, 14.11.2022,
Assignment	05.8.2022, 13.9.2022, 19.10.2021
Quiz	12.8.2022,19.10.2022, 02.11.2022(Objective Type Questions)
Seminar	21.9.2022,13.10.2022,27.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty : **Ms. P.V. Dhaarani**

Department : **Geology**

Programme : **B.Sc**

Programme Code : **BGE4**

Name of the Paper : **Remote sensing and Mining Geology**

Lecture Hours : **45 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• The paper deals about the basics of remote sensing and image processing. • Attain a foundational knowledge and comprehension of the physical, computational, and perceptual basis for remote sensing. • Gain familiarity with a variety of earth science applications of remote sensing. • To study the sensor characteristics, satellite orbits and various current and future missions involving a range of sensors across the visible, radar and microwave components of the spectrum • To study the surface and underground mining methods	On completion of the course, learners should be able to CO 1:Recognize and explain at basic level fundamental physical principles of remote sensing, including the electromagnetic spectrum; the emission, scattering, reflection, and absorption of electromagnetic (EMR) radiation CO 2: Student would understand the remote sensing, image processing and application of Geographic Information system. CO 3: Students will be able to recognize and explain basic computational properties of remote sensing data acquisition, storage, and image processing. CO 4: Students will be able to discuss the surface and subsurface mining methods.	❖ Power Point ❖ E – Module ❖ Chalk & Talk Method ❖ Lecture Method ❖ Discussion Method ❖ Study Assignment Method, ❖ Problem Solving Method ❖ Seminar Method ❖ Demonstration Method

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C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
Unit I Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	• Introduction to Remote Sensing: Definition of Remote sensing - processes and elements involved in electromagnetic remote sensing of earth resources • Electromagnetic spectrum and its components – Atmospheric windows • Energy interaction in the atmosphere – Energy interactions with earth surface features • Spectral reflectance curves of water, vegetation and soil Data acquisition and interpretation. An outline of remote sensing applications.	23.07.2022 to 16.08.2022	3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-
Unit II Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	• Photogeology: Types of aerial photographs, Scale in aerial photographs and causes for its variation • Flight planning procedures Mosaic and its types Stereoscopy and stereoscopes • Outline of vertical exaggeration and parallax • Principles of photo interpretation – Annotation of aerial photographs.	17.08.2022 to 15.09.2022	3Hrs 3Hrs 3Hrs 3Hrs	3Hrs	-
Unit III Lecture - 12 Hours, Assessment-3 Hours, Total – 15 Hours	• Satellite Remote Sensing: Types of satellites – Scanning systems and detectors – • Sensor resolutions: spatial, spectral, radiometric and temporal; Sensor • characteristics of Landsat, Spot and IRS and high	16.09.2022 to 14.10.2022	3Hrs 3Hrs 3Hrs	3Hrs	-

	resolution satellites; • Satellite image interpretation: visual and digital interpretation techniques and an outline of digital image processing techniques		3Hrs		

D. ACTIVITIES:

Activities Name	Details
Test	Unit Test Date 18.8.2021, 20.9.2021, 25.10.2021,
Assignment	18.8.2022, 21.9.2022, 20.10.2021
Quiz	30.8.2022,23.09.2022, 27.10.2022(Objective Type Questions)
Seminar	19.9.2022,7.10.2022,25.10.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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TEACHING PLAN

A. GENERAL INFORMATION

Name of the Faculty	**:**	**Ms. P.V. Dhaarani**
Department	**:**	**Geology**
Programme	**:**	**B.Sc**
Programme Code	**:**	**BGS2**
Name of the Paper	**:**	**Water Quality Analysis**
Lecture Hours	**:**	**30 Hrs**

B. ABOUT THE COURSE:

Course Objectives	Course Outcomes	Teaching Methodology
• To study the physical properties of minerals • To study the pH and their measurements • To make the students understand the water pollution • To understand the Reverse Osmasis system • To gain knowledge on water borne diseases	On completion of the course, learners should be able to CO 1: Students able to discuss the water quality parameters CO 2: Understand the laboratory techniques CO 3: To discuss the water related diseases and remedial measures. CO 4: Describe the Fluoride and Arsenic in groundwater CO 5: Students able to discuss the various drinking water standards	❖ Power Point ❖ E – Module ❖ Chalk & Talk Method ❖ Lecture Method ❖ Discussion Method ❖ Study Assignment Method ❖ Seminar Method ❖ Demonstration Method

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C. PLAN OF THE WORK:

Unit / Modules	Topic to be covered	Proposed date	Lecture Hrs	Assessment Hrs	Remarks
Unit I Lecture - 4 Hours, Assessment-2 Hours, Total – 6 Hours	• Physical properties of water: Colour, odour, taste, temperature, turbidity and viscosity. • Methods of analysis of physical properties. • World Health Organisation (WHO) • Bureau of Indian Standards (BSI).	02.08.2022 to 09.08.2022	4 Hrs	2 Hrs	-
Unit II Lecture - 4 Hours, Assessment-2 Hours, Total – 6 Hours	• Chemical properties of water: pH-alkalinity, acidity and their measurements • ionization potential, gas soloubility, precipitation and dissolution of ions, • equivalent weight and its measurements, colloids and cogulation, • Insoluble components and their measurements.	19.08.2022 to 25.08.2022	4 Hrs	2 Hrs	-
Unit III Lecture - 4 Hours, Assessment-2 Hours, Total – 6 Hours	• Laboratory methods of Analysis: standard solutions- • Determination of Ph-Hardness-Dissolved oxygen- • BOD-COD,TDS-TSS. • Determination of F, Cl, N, P, K, Na, Ca, Mg, Fe, CaCo3, HCO3 & Trace Metals.	02.09.2022 to 07.09.2021	4 Hrs	2 Hrs	-
UNIT IV Lecture - 4 Hours, Assessment-2 Hours, Total – 6 Hours	• Utility of standards required for potable purpose • Agricultural purpose • Industrial purposes. • Tools used for assessing the quality of water	20.09.2022 to 24.09.2022	4 Hrs	2 Hrs	
UNIT V Lecture - 4 Hours, Assessment-2 Hours, Total – 6 Hours	• Water pollution: Urban, Industrial pollution and remedial measures. • Arsenic and Fluoride content in water. • Recycling of water, water borne diseases, • Reverse Osmosis (RO) system and Desalination of water.	10.10.2022 to 15.10.2022	4 Hrs	2 Hrs	

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D. ACTIVITIES:

Activities Name	Details
Test Assignment	Unit Test Date 17.8.2022, 15.9.2021, 26.10.2021, 25.8.2022, 23.9.2022, 07.10.2021
Quiz	26.8.2022,17.10.2022, 30.10.2022(Objective Type Questions)
Seminar	28.9.2022, 21.10.2022, 12.11.2022
Tutor Ward Meeting	Monthly Once
Mentor Mentee Meeting	Weekly Once

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